

What Is Claimed Is:

1. A pointing device comprising:
 - a light emitting means for illuminating a subject selected from the group consisting of a surface of a finger, a lattice, and any perceivable pattern;
 - 5 a hole through which light from the light emitting means is transmitted;
 - an image-acquisition area for taking an image of the subject from the transmitted light;
 - an image-formation means for forming an image by focusing the light reflected from the image-acquisition area;
 - 10 a conversion means for converting the image formed by the image-formation means into an electric signal; and
 - an operation means for detecting the change of the image and calculating the amount of the change using the electric signal output from the conversion means.
- 15 2. A pointing device comprising:
 - a light emitting means;
 - a light guide structure for guiding light from the light emitting means to a subject selected from the group consisting of a surface of a finger, a
 - 20 lattice, and any perceivable pattern;
 - an image-acquisition area for taking an image of the subject from the guided light;
 - an image-formation means for forming an image by focusing the light reflected from the image-acquisition area;
 - 25 a conversion means for converting the image formed by the image-formation

means into an electric signal; and
an operation means for detecting the change of the image and calculating the
amount of the change using the electric signal output from the conversion
means.

5

3. The pointing device as defined by claim 1 or claim 2, wherein the light
emitting means is selected from the group consisting of a light emitting
diode, a laser diode, and an organic electroluminescence.

10

4. The pointing device as defined by claim 3, wherein the light emitting
means comprises at least one light emitting diode.

5. The pointing device as defined by claim 1 or claim 2, wherein the
conversion means is a CMOS image sensor or a CCD image sensor.

15

6. The pointing device as defined by claim 1 or claim 2, further comprising a
selection button for selecting a target with a pointer moved by the pointing
device or entering a command.

20

7. The pointing device as defined by claim 1 or 2, wherein the image-
formation means is one selected from the group consisting of a spherical
or non-spherical lens and a spherical or non-spherical mirror.

8. A pointing device comprising:
a light emitting means;

25

- a light guide structure for guiding light from the light emitting means to a subject;
- an image-acquisition area for taking an image of the subject from the guided light;
- 5 an image-formation means for forming an image by focusing the light reflected from the image-acquisition area;
- a housing coupled to the image-formation means;
- a conversion means for converting the image formed by the image-formation means into an electric signal;
- 10 a printed circuit board on which the conversion means is fixed;
- a cover for protecting the light emitting means, the image-formation means, the housing, the conversion means, and the printed circuit board; and
- an operation means for detecting the change of the image and calculating the amount of the change using the electric signal output from the conversion means.
- 15
9. The pointing device as defined by claim 8, wherein the subject is one selected from the group consisting of a surface of a finger, a lattice, and any perceivable pattern.
- 20
10. The pointing device as defined by claim 8, further comprising a contact sensor for determining whether the pointing device is in use.
11. The pointing device as defined by claim 10, wherein the contact sensor is embodied by means of a direct contact or non-contact fashion.
- 25

12. The pointing device as defined by claim 10, wherein the contact sensor controls an on-off state of the light emitting means or the conversion means based on whether the contact sensor is touched by a human body or an object.

13. The pointing device as defined by claim 10, wherein the contact sensor is positioned around the image-acquisition area within a radius of about 3 cm from the center of the image acquisition area.

14. The pointing device as defined by claim 10, wherein the contact sensor operates the pointing device only for a program requiring the pointing device.

15. The pointing device as defined by claim 10, wherein the contact sensor performs the role of a selection switch for selecting the present position or a predetermined function indicated by a pointer.

16. The pointing device as defined by claim 15, wherein the role of the selection switch is performed according to the change of time interval between contact and non-contact to the contact sensor.

17. The pointing device as defined by claim 8, wherein the light guide structure, the image-formation means, and the housing are united as an integral structure.

18. The pointing device as defined by claim 1, claim 2 or claim 8, wherein the image-acquisition area is coated in order to prevent damage or contamination of the image-acquisition area.

5

19. The pointing device as defined by claim 1, claim 2 or claim 8, wherein the operation means receives the electric signal from the conversion means and determines the distance and direction for a pointer to be moved by calculating the electric signal.

10

20. The pointing device as defined by claim 1, claim 2 or claim 8, wherein the image-acquisition area is a transparent member or a virtual plane positioned at a predetermined distance from the image-formation means.